

Overview

HPE Alletra Storage 6000

Experience the Power of Predictive

Is your enterprise class storage holding you back because you are tied down administering, tuning, and supporting infrastructure? Are you looking to shift to a cloud everywhere experience with the same agility, simplicity, and cloud consumption for every application?

HPE Alletra powers your data from edge-to-core with the cloud experience for all your apps. For business-critical workloads, HPE Alletra Storage 6000 delivers fast, consistent performance and industry leading data efficiency. It enables IT to shift from owning and maintaining data infrastructure to simply accessing and utilizing it on-demand, as-a-service. Eliminate performance and efficiency trade-offs with no knobs or configurations to adjust and always-on data services. Get resilient storage with intelligence and a no single point of failure platform that together deliver 6-nines availability guaranteed. Deliver on recovery SLAs with fast, integrated app aware backup and recovery—on-premises and in the cloud.

What's new

- Eliminate complexity by unifying infrastructure management silos under a cloud managed single pane of glass - accessible from anywhere and from any device.
- Developed from the foundation of HPE Nimble Storage architecture, proven to deliver speed, efficient, and resiliency with cloud agility.
- Delivers up to 3X faster performance than previous HPE Nimble Storage All Flash Arrays.
- Designed for high availability requirements with 6-nines availability guaranteed as a standard benefit without requiring a special contract.
- HPE Store More Guarantee¹ delivers more effective capacity per terabyte of raw flash than competitive all-flash arrays.
- Eliminate forklift upgrades, non-disruptive controller upgrades, flat support pricing, and flexible consumption options.

Notes:

- For more information about HPE Alletra, go to: <https://www.hpe.com/storage/Alletra>
 - ¹For details on the HPE 6-Nines Guarantee, refer to: <https://www.hpe.com/psnow/doc/a50003574enw>
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Overview



HPE Alletra Storage 6000 array
(Base array, 4U; 24 bays with NVMe SSDs)



Standard Features

AI-driven

- Predict and prevent disruptions across storage, services, and virtual machines, resulting in savings of over 1.5 million hours of lost productivity due to downtime.
 - Redefine support experience with predictive support automation that delivers an unprecedented support experience with automated L1 and L2 and direct access to the resources you need.
 - Pinpoint issues between storage and VMs and underutilized virtual resources without effort.
 - Take the guesswork out of managing data infrastructure with AI-driven recommendations that improves performance, drives higher availability, and optimizes resource utilization and planning.
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Built for Cloud

- Setup in minutes because systems are automatically discovered, on-boarded, and configured.
 - Say goodbye to time-consuming, LUN-centric provisioning with AI-driven, intent based provisioning of application workloads on infrastructure best suited for optimizing SLAs.
 - Experience faster access to innovation with no disruptions because new features and enhancements are instantly available through self-service upgrades.
 - Manage from anywhere with simple global management driven through a SaaS-based user experience.
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As-a-Service

- Consume data infrastructure as a service via HPE GreenLake, eliminating up front capital costs with a pay-per-use model.
 - Shift from owning and maintaining data infrastructure to simple accessing and utilizing it on-demand.
 - Free up your cash flow and increase financial agility with the right mix of subscription and consumption-based services.
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Absolute Resiliency

- 99.9999% (6-nines) guaranteed availability
 - Triple+ Parity RAID tolerates 3 simultaneous drive failures plus additional protection through intra-drive parity.
 - App-granular, FIPS-certified encryption provides data at rest and over-the-wire protection. Secure data shredding is built in.
 - Native application-consistent snapshots and replication plus integration with leading backup software.
 - Redundant, hot-swap components including controllers, power supplies, SSDs, and IO cards.
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HPE Data Services

HPE Alletra Storage 6000 arrays include a subscription to HPE Data Ops Manager for cloud-based management of the array from the HPE Data Services. The subscription is included in the quote when support is selected and has the same duration as support. For more information, please refer to the HPE Data Services QuickSpecs:

<https://h20195.www2.hpe.com/v2/getdocument.aspx?docname=a50002569enw>



Standard Features

| HPE Alletra Storage 6000 Models | | | | | | |
|---|----------------|--------|----------|----------|----------|--------------------------------|
| AF-Series Arrays | 6010 | 6030 | 6050 | 6070 | 6090 | Scale-out ¹ 4X 6090 |
| Raw capacity (TB) ^{2,5} | 23-92 | 23-184 | 23-575 | 23-1,104 | 23-1,104 | 92-4,416 |
| Usable capacity (TB) ^{2,8} | 12-66 | 12-135 | 12-422 | 12-820 | 12-820 | 48-3,260 |
| Effective capacity (TB) ^{2,3} | 60-330 | 60-675 | 60-2,110 | 60-4,100 | 60-4,100 | 240-16,400 |
| Max. # of expansion shelves | 1 | 2 | 2 | 2 | 2 | 8 |
| RAID level support | Triple+ Parity | | | | | |
| Onboard Mgmt 1GBase-T ports per array ^{4,6} | 8 | 8 | 8 | 8 | 8 | 32 |
| Optional iSCSI 10GBase-T ports per array ⁶ | 8-24 | 8-48 | 8-48 | 8-48 | 8-48 | 8-192 |
| Optional iSCSI 10GbE ports per array ⁶ | 8-24 | 8-48 | 8-48 | 8-48 | 8-48 | 8-192 |
| Optional iSCSI 25GbE ports per array ⁶ | 4-12 | 4-24 | 4-24 | 4-24 | 4-24 | 4-96 |
| Optional iSCSI 100GbE ports per array ⁶ | 4 | 4, 8 | 4, 8 | 4, 8 | 4, 8 | 4-48 |
| Optional 2P 32Gb FC (8/16Gb) ports per array ^{6,9} | 4-12 | 4-24 | 4-24 | 4-24 | 4-24 | 4-96 |
| Optional 4P 32Gb FC (8/16Gb) ports per array ^{6,9} | 8 | 8, 16 | 8, 16 | 8, 16 | 8, 16 | 8-64 |

Notes:

- Specifications are subject to change without notice.
 - o ¹ Scale-out configuration consists of up to four (4) HPE Alletra Storage 6000 and/or Nimble Storage arrays; mixed models and generations supported; specifications listed above are for 4x 6090 arrays, each with two all-flash shelves.
 - o ² Raw, usable, and effective capacities are shown in TB (10¹² bytes). Usable and effective capacities take into account space used for parity, spares, and system overhead.
 - o ³ Effective capacity is the capacity of the base array and maximum number of expansion shelves. Assumes data reduction of five to one (5:1) from deduplication and compression.
 - o ⁴ Each array controller has 4 x 1GbaseT ports built in. Optional ports are 10GbaseT, 10GbE SFP+, 25GbE SFP28, 100GbE QSFP28, and 32Gb (16Gb) FC.
 - o ⁵ The Total Max Raw Capacity per system is limited by the architecture of the system and is not to be exceeded, even if it may be possible to configure a system that exceeds this limit.
 - o ⁶ Array port counts shown include both controllers.
 - o ⁸ Usable capacity has changed from previous generation arrays to allow larger core dumps to be processed on the Alletra 6000. Reference NinjaSTARS for detailed usable capacity.
 - o ⁹ The 32Gb Fibre Channel cards can auto-negotiate to 32Gb, 16Gb, or 8Gb connectivity to the switch

Host OS Support

Microsoft® Windows® Server, including Microsoft® Hyper-V™ | VMware vSphere™ | HP-UX® | Ubuntu
 SUSE® Linux Enterprise | SUSE® Linux Virtualization | Red Hat® Enterprise Linux® | Red Hat® Enterprise Virtualization
 CentOS | Oracle® Linux® (UEK and RHEL compatible kernels) | Oracle® Solaris | Citrix® XenServer | IBM® AIX®

Notes: For the latest information on supported operating systems refer to Single Point of Connectivity Knowledge (SPOCK) for HPE Storage products: <https://h20272.www2.hpe.com/spock/>



Service and Support

Warranty

HPE Alletra Storage 6000 arrays come with the following warranties:

- 1-year; parts-only warranty for hardware components, including SSDs
- 90-day, software updates for defects

Additionally, HPE Alletra Storage 6000 will provide phone support for replacing a defective part. Additional support coverage is required for HPE Alletra Storage 6000 arrays.

Notes:

- For hardware warranty claims, defective part must be received before replacement parts are shipped.
- Warranty is provided by HPE Alletra Storage 6000.
- Link to [HPE Global Limited Warranty and Technical Support](#).

Service and Support

Support is required for all HPE Alletra Storage 6000 arrays. Support SKUs provide up to five years of 24x7 telephone and email support for the arrays and hardware components (including SSDs reaching the write wear limit) with a choice of Next Business Day (NBD) parts exchange, Next Business Day (NBD) onsite support, 4-hour parts exchange, or 4-hour onsite support, access to the HPE InfoSight predictive analytics platform and software updates.

HPE Services **Tech Care** is the new operational service experience for HPE products. Tech Care goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service has been reimaged from the ground up to support a customer-centric, AI-driven, and digitally enabled customer experience to move your business forward.

Notes: Support contract is mandatory for all HPE Alletra Storage 6000 products.

Data Services Support with HPE Alletra Storage 6000

A valid subscription enables the following enterprise-level support:

- 24x7 telephone and email support for all entitled services available through HPE Data Services
- Direct connection to expert-level support within minutes
- Guidance through troubleshooting and configuration of available service and interoperability within your cloud and/or on-premises environment.

Installation Services

Installation Services are intended to guide you from start to finish and to help make your installation a success. Our engagement includes:

- Inventory and verify HPE Alletra Storage 6000 equipment against the sales order
- Physically rack and cable all HPE Alletra Storage 6000 equipment, including connecting network cables provided by the customer
- Conduct power-on tests and verify operation
- Add the array to an existing HPE Alletra Storage 6000 or HPE Nimble Storage Group, if applicable
- Configure array's basic management, monitoring, & reporting capabilities
- Configure array for additional data networks / SAN connectivity as needed
- Upgrade the array to the latest recommended HPE Alletra Storage 6000 or HPE Nimble OS version as needed

HPE Tier 1 Storage Array Startup service - HA124A1#5MR

Provides full hardware and software installation of a new HPE Tier 1 Storage array in a data center with up to six (6) shelves. Quote this service when you want onsite and remote assistance in setting up a new array from hardware racking through setting up vVols on servers in the configuration. This service may not be quoted as part of a Greenfield or Brownfield dHCI storage configuration. [HPE Tier 1 Storage Array Startup Service data sheet](#)



Service and Support

HPE Tier 1 Storage Upgrade service – HA124A1#5MS

On-site installation of upgrades kits or for an existing HPE Tier 1 Storage array. This service is for in-family upgrades only and cannot be quoted to upgrade an existing array to the next generation of storage. This service can be used to upgrade components within an existing Greenfield or Brownfield dHCI storage configuration.

HPE Tier 1 Storage Cross Family Offline Upgrade service – HA124A1#V0R

Provides the on-site hardware upgrade and disk migration from your existing array to the new family array chassis. This service is completed with the array powered off during a downtime window.

Notes: All Installation and upgrade services are optional for all HPE Alletra Storage 6000 products.

HPE Tier 1 Storage Peer Persistence Setup Service - HA124A1#V0S

Provides remote implementation of the Peer Persistence software functionality available in the HPE Alletra Storage 6000/Nimble Storage operating system (OS). This service provides analysis, implementation, and testing services necessary for you to deploy the HPE Nimble Storage Peer Persistence features.

HPE Services

No matter where you are in your digital transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.

<https://www.hpe.com/services>

Consulting Services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.

<https://www.hpe.com/services/consulting>

HPE Managed Services

HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

[HPE Managed Services | HPE](#)

Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.

<https://www.hpe.com/services/operational>

HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

<https://www.hpe.com/services/complecare>



Service and Support

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.

<https://www.hpe.com/services/techcare>

HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

Notes: To review the list of Lifecycle Services available for your product go to:

<https://www.hpe.com/services/lifecycle>

For a list of the most frequently purchased services using service credits, see the [HPE Service Credits Menu](#)

Other Related Services from HPE Services:

HPE Education Services

Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.

<https://www.hpe.com/services/training>

Defective Media Retention

An option available with HPE Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Parts and Materials

HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.



Service and Support

How to Purchase Services

Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at <https://ssc.hpe.com/portal/site/ssc/>

AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience

Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.

<https://support.hpe.com/hpesc/public/home/signin>

Consume IT On Your Terms

HPE GreenLake edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"

<https://www.hpe.com/us/en/contact-hpe.html>

For more information

<http://www.hpe.com/services>



Configuration Information

Step 1 – Choose Base configuration

All HPE Alletra Storage 6000 come in a 4U form-factor chassis with

- (2) controllers with processors, memory, fans and NVDIMM, and
- (8) 1GBase-T network ports, i.e. (4) per controller for iSCSI or management traffic, and
- All-inclusive software including HPE InfoSight predictive analytics

Additional host connectivity per controller is indicated in the product descriptions below.

Flash capacity upgrades, network upgrades and expansion shelves will be available for integration in the field.

HPE Alletra Storage 6000 – Base Configuration Base Array

| Description | SKU |
|--|--------|
| HPE Alletra 6010 Dual Controller Configure-to-order Base Array | R4U28A |
| HPE Alletra 6030 Dual Controller Configure-to-order Base Array | R4U29A |
| HPE Alletra 6050 Dual Controller Configure-to-order Base Array | R4U30A |
| HPE Alletra 6070 Dual Controller Configure-to-order Base Array | R4U31A |
| HPE Alletra 6090 Dual Controller Configure-to-order Base Array | R4U32A |

Step 2 – Choose Power Supplies

All HPE Alletra Storage 6000 require one (1) of the Power Supply Kits listed below. Each Power Supply Kit includes four (4) Power Supplies; either 800W AC, 1600W AC, or 2200W AC.

Table below shows All Flash Array compatibilities with Power Supply Kits.

| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
|------|------|------|------|------|---|--------|
| Yes | Yes | Yes | No | No | HPE Alletra Storage 6000 4x 800W FIO AC Power Supply Kit | R7G12A |
| No | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 4x 1600W FIO AC Power Supply Kit | R7G13A |
| Yes | No | No | No | No | HPE Alletra Storage 6000 4x 800W Titanium FIO Power Supply Kit | S0R22A |
| No | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2200W Titanium Tech Refresh Power Supply | S0R23A |

Notes:

- The R7G12A power supplies support both low-line and high-line
- The R7G13A, S0R22A, S0R23A power supplies support high-line; no low-line support
- The R7G13A power supplies are recommended when there is a choice between R7G12A and R7G13A
- Both the R7G12A and the R7G13A AC power supplies are 80 PLUS Platinum certified
- Both the S0R22A and the S0R23A AC power supplies are 80 PLUS Titanium certified
- The Titanium certified power supply kits (S0R22A & S0R23A) are mandatory to meet EU Lot9 requirements



Configuration Information

Step 3 – Choose Head SSD Capacity

All HPE Alletra Storage 6000 require one or two of the following SSD capacity options.

Table below shows All Flash Array compatibilities with SSD Options.

| Head SSD Capacity Options | | | | | | SKU |
|---------------------------|------|------|------|------|---|--------|
| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 23TB (12x1.92TB) NVMe Flash Carrier FIO Flash Bundle | R7S81A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 46TB (12x3.84TB) NVMe Flash Carrier FIO Flash Bundle | R7S83A |
| No | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 92TB (12x7.68TB) NVMe Flash Carrier FIO Flash Bundle | R7S85A |
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 184TB (12x15.36TB) NVMe Flash Carrier FIO Flash Bundle | R7S87A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 46TB (24x1.92TB) NVMe Flash Carrier FIO Flash Bundle | R7S82A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 92TB (24x3.84TB) NVMe Flash Carrier FIO Flash Bundle | R7S84A |
| No | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 184TB (24x7.68TB) NVMe Flash Carrier FIO Flash Bundle | R7S86A |
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 368TB (24x15.36TB) NVMe Flash Carrier FIO Flash Bundle | R7S88A |

| Platform SSD Capacities | | | | | |
|--|-------|--------|--------|---------|---------|
| | 6010 | 6030 | 6050 | 6070 | 6090 |
| Minimum platform SSD capacity (RAW) | 23 TB | 23 TB | 23 TB | 23 TB | 23 TB |
| Maximum platform SSD capacity (RAW)= (Head SSD+ expansion) capacity (TB) | 92 TB | 184 TB | 575 TB | 1104 TB | 1104 TB |
| Memory installed (GB) per controller | 64 GB | 128 GB | 256 GB | 448 GB | 896 GB |

Step 4 – Choose Head Networking Option

Up to six (6) of the following networking options can be selected. Please refer to configuration guidelines for specific support of networking options for each array. The HPE Alletra 6010 array supports up to three (3) head networking options.

Notes:

- The following minimum ports are recommended for best performance:
 - o 6010: at least 2-ports
 - o 6030: at least 4-ports
 - o 6050: at least 8-ports
 - o 6070: at least 8-ports
 - o 6090: at least 8-ports
- Max One (1) Storage Class Memory kit (ROP46B or ROP48B) per 6050/6070/6090 array
- Max Two (2) 100GbE kits or 32Gb FC 4-port kits (ROR18A/ROR19A or ROR14A/ROR15A) per 6030/6050/6070/6090 array
- Max One (1) 100GbE kits or 32Gb FC 4-port kits (ROR18A/ROR19A or ROR14A/ROR15A) per 6010 array
- All 10GbE kits (Q8C17C and Q8C20C) and 32Gb FC kits (ROP34A and ROR14A) include transceivers
- The 10/25GbE Adapter Kit (ROR12A) and the 100GbE Adapter kit (ROR18A) do not include transceivers. If transceivers are required, they will need to be ordered separately.
- Each Head networking option includes two (2x) cards which are evenly populated in the two controllers.



Configuration Information

| Head Networking Options | | | | | | |
|---------------------------------------|------|------|------|------|--|--------|
| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x10GbE 4-port FIO Adapter Kit | Q8C17C |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x10GBASE-T 4-port FIO Adapter Kit | Q8C20C |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x10/25GbE 2-port FIO Adapter Kit | R0R12A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x100GbE 2-port FIO Adapter Kit | R0R18A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x32Gb 2-port Fibre Channel FIO Adapter Kit | R0P34A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x32Gb 4-port Fibre Channel FIO Adapter Kit | R0R14A |
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 1.5TB Storage Class Memory FIO Adapter Kit | R0P46B |
| Transceivers (FIO) | | | | | SKU Description | SKU |
| Supported with 2x10/25GbE 2-port kits | | | | | HPE Alletra Storage 6000 2x10Gb SFP+ SR FIO Transceiver | R7D05A |
| Supported with 2x10/25GbE 2-port kits | | | | | HPE Alletra Storage 6000 2x25Gb SFP28 SR 100m FIO Transceiver | R7D07A |
| Supported with 2x100GbE 2-port kits | | | | | HPE Alletra Storage 6000 2x100Gb QSFP28 MPO SR4 100m FIO Transceiver | R7D08A |

Step 5 – Add Software (Mandatory)

HPE Alletra Software and Support SaaS

HPE Alletra Storage 6000 arrays include a subscription to HPE Alletra Software and Support SaaS that enables cloud-based management of the array from the HPE Data Services Cloud Console and access to data services as they become available on HPE GreenLake. The subscription includes access to the HPE Alletra software and related support. It is included in the quote when support is selected and has the same duration as support. For more information, please refer to the HPE Data Services QuickSpecs:

<https://h20195.www2.hpe.com/v2/getdocument.aspx?docname=a50002569enw>.

Description

| Description | SKU |
|--|----------|
| HPE Alletra Storage 6000 per TB 3-year Software and Support SaaS | SOR27AAE |
| HPE Alletra Storage 6000 per TB 4-year Software and Support SaaS | SOR28AAE |
| HPE Alletra Storage 6000 per TB 5-year Software and Support SaaS | SOR29AAE |

Subscribe to the HPE Backup and Recovery Service

The HPE Backup and Recovery Service is an optional subscription service available from the HPE GreenLake Cloud Portal. It is the modern way to protect VMware virtual machines that use storage from HPE Alletra systems. The subscription enables automated, Array Optimized, cloud managed protection of the virtual machine. The HPE Backup and Recovery Service is available with a subscription to meet your needs. Working with your HPE account representative you can define whether you want total flexibility to pay for the service as you use it or if you want to lock in lower prices by reserving the service for 1, 2, 3, 4 or 5 years. When you reserve the service you choose the number of virtual machines you want to protect and, if you want to protect your virtual machines with backup to the cloud, the capacity of the Cloud Protection Store you will need. For more information, please refer to the HPE Backup and Recovery Service QuickSpecs:

<https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=a50004269enw>



Configuration Information

Step 6 – Optional NVMe All-Flash Shelf

The HPE Alletra 2140 4U All Flash expansion shelves include two (2) 100Gb QSFP28 to QSFP28 1m direct attach copper (DAC) cables for connectivity. The All Flash expansion shelf requires:

- Min 1/Max 1 of 2x100GbE 2-port OCP Mezzanine adapter kit. Order R6J21A to have the OCP adapters factory integrated into the array when the both the array and expansion shelf are ordered together. Order R6J22A when the expansion shelf is going to be added to an existing array.
- Min 1/Max 1 of the listed Flash Bundles
- Four (4) power supplies
- Four (4) power cords
- With array OS 6.1.2.0 and later, a 2140 expansion shelf can be used with HPE Alletra Storage 6000 configured with 2x 12-SSD flash bundles.

Min 0, Max 2 expansion shelves per array

| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
|------|------|------|------|------|--|--------|
| Yes | Yes | Yes | Yes | Yes | HPE Alletra 2140 4U All Flash Configure-to-order Expansion Shelf | R6F54A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x100GbE 2-port OCP FIO Mezzanine Adapter Kit | R6J21A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x100GbE 2-port OCP Mezzanine Adapter Field Upgrade | R6J22A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 46TB (24x1.92TB) NVMe Flash Carrier FIO Flash Bundle | R7S82A |
| No | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 92TB (24x3.84TB) NVMe Flash Carrier FIO Flash Bundle | R7S84A |
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 184TB (24x7.68TB) NVMe Flash Carrier FIO Flash Bundle | R7S86A |

| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
|------|------|------|------|------|---|--------|
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 368TB (24x15.36TB) NVMe Flash Carrier FIO Flash Bundle | R7S88A |
| 1 | 2 | 2 | 2 | 2 | Max number of expansion shelves per array model | |

Step 7 – Add Support (Mandatory)

Support recommendations are designed to help you enhance technology operations, lower risk, and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from four levels of Tech Care that cover the entire lifecycle to better address your needs from 3, 4 and 5-year durations for service levels ranging from Basic Exchange (Next Business Day parts exchange) to Essential (4-hour onsite response).

| Description | SKU |
|--|-------------|
| HPE Tech Care Basic Exchange SVC | HU4B5A3/4/5 |
| HPE Tech Care Basic Exchange w/DMR SVC | HU4B6A3/4/5 |
| HPE Tech Care Basic Exchange w/CDMR SVC | HU4B7A3/4/5 |
| HPE Tech Care Basic SVC | HU4B2A3/4/5 |
| HPE Tech Care Basic w/DMR SVC | HU4B3A3/4/5 |
| HPE Tech Care Basic w/CDMR SVC | HU4B4A3/4/5 |
| HPE Tech Care Essential Exchange SVC | HU4A9A3/4/5 |
| HPE Tech Care Essential Exchange w/DMR SVC | HU4B0A3/4/5 |

Configuration Information

Description

| | SKU |
|---|-------------|
| HPE Tech Care Essential Exchange w/CDMR SVC | HU4B1A3/4/5 |
| HPE Tech Care Essential SVC | HU4A6A3/4/5 |
| HPE Tech Care Essential w/DMR SVC | HU4A7A3/4/5 |
| HPE Tech Care Essential w/CDMR SVC | HU4A8A3/4/5 |

Notes: Minimum support required 3-year HPE Tech Care Basic Exchange

Installation Services

- Installation Services are intended to guide you from start to finish and to help make your installation a success.

Notes: Installation services are optional.

| | |
|---|-------------|
| HPE Tier 1 Storage Array Startup service | HA124A1#5MR |
| HPE Tier 1 Storage Array Upgrade service | HA124A1#5MS |
| HPE Tier 1 Storage Cross Family Offline Upgrade service | HA124A1#VOR |

Racks

HPE Alletra Storage 6000 arrays and expansion shelves are compatible with industry standard 4-post EIA 19-inch racks with square mounting holes, including HPE 36U, 42U and 48U Enterprise Shock Racks. HPE recommends HPE racks with a depth of 1200mm as it provides ample room for cabling and ease of serviceability.

Recommended Racks:

HPE G2 Enterprise Series Racks

- HPE 48U 600mmx1200mm G2 Enterprise Rack
- HPE 48U 800mmx1200mm G2 Enterprise Rack
- HPE 42U 600mmx1200mm G2 Enterprise Rack
- HPE 42U 800mmx1200mm G2 Enterprise Rack

HPE G2 Advanced Series Racks

- HPE 48U 600mmx1200mm G2 Advanced Rack
- HPE 48U 800mmx1200mm G2 Advanced Rack
- HPE 42U 600mmx1200mm G2 Advanced Rack
- HPE 42U 800mmx1200mm G2 Advanced Rack
- HPE 36U 600mmx1200mm G2 Advanced Rack
- HPE 36U 800mmx1200mm G2 Advanced Rack

Notes:

- For more information on the HPE rack offerings, please see the following URL: <https://www.hpe.com/info/rackandpower>
- For more information on PDUs, see: <http://www.hpe.com/servers/pdu>

Step 8: Required power cords

HPE Alletra Storage 6000 arrays and expansion shelves do not ship with any power cords by default and require a minimum of 4 power cords per system. Please ensure these are selected at time of quoting. Four power cords are required when connecting base arrays (C13/C14 or expansion shelves (C13/C14) to Rack-Mounted Power Distribution Units (PDU). Four country/region specific power cords are required when connecting base arrays or expansion shelves to standard office wall power outlets.

Description

| | SKU |
|--|------------|
| HPE PE361L - LS-60 250V 10Amp 1.8m IN FIO Power Cord | Q8G57A |
| HPE WS-016 - C13 250V 10Amp 2.5m ZA FIO Power Cord | Q8G58A |
| HPE SI-32 - C13 250V 10Amp 2.5m IL FIO Power Cord | Q8G59A |

Configuration Information

Description

| | SKU |
|--|--------|
| HPE CEI 23-16 - C13 250V 10Amp 2.5m IT FIO Power Cord | Q8G60A |
| HPE AS 3112 - C13 250V 10Amp 2.5m AU FIO Power Cord | Q8F89A |
| HPE WS-010A - C13 250V 10Amp 2.5m EU FIO Power Cord | Q8F90A |
| HPE BS 1363 UK10 - C13 250V 10Amp 2.5m UK FIO Power Cord | Q8F91A |
| HPE NEMA 5-15P - C13 125V 13Amp 1.8m US FIO Power Cord | Q8F92A |
| HPE GB2099 - C13 250V 10Amp 2.5m CN FIO Power Cord | Q8F93A |
| HPE WS-010A - C13 250V 10Amp 2.5m KR FIO Power Cord | Q8F94A |
| HPE JIS 8303 - C13 125V 12Amp 2.5m TW/JP FIO Power Cord | Q8F95A |
| HPE NEMA 6-15P - C13 250V 12Amp 2.5m JP FIO Power Cord | Q8F96A |
| HPE C13 - C14 250V 10Amp 2m WW PDU FIO Power Cord | R9D23A |
| HPE C13 - C14 250V 10Amp 2m IN PDU FIO Power Cord | R9D24A |

Field Upgrade Options

The following product options are to upgrade currently installed Alletra 6000 All Flash Arrays.

Controller upgrades Max one of the following:

| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
|------|------|------|------|------|--|--------|
| Yes | No | No | No | No | HPE Alletra 6030 All Flash Array Dual Controller Field Upgrade | R6H91A |
| Yes | Yes | No | No | No | HPE Alletra 6050 All Flash Array Dual Controller Field Upgrade | R6H92A |
| Yes | Yes | Yes | No | No | HPE Alletra 6070 All Flash Array Dual Controller Field Upgrade | R6H93A |
| Yes | Yes | Yes | Yes | No | HPE Alletra 6090 All Flash Array Dual Controller Field Upgrade | R6H94A |

SSD Capacity Upgrade on Head Max one of the following:

| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
|------|------|------|------|------|--|--------|
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 23TB (12x1.92TB) NVMe Flash Carrier Flash Field Upgrade | R7S89A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 46TB (12x3.84TB) NVMe Flash Carrier Flash Field Upgrade | R7S90A |
| No | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 92TB (12x7.68TB) NVMe Flash Carrier Flash Field Upgrade | R7S91A |
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 184TB (12x15.36TB) NVMe Flash Carrier Flash Field Upgrade | R7S92A |

Head Network Add / Upgrade Options

| 6010 | 6030 | 6050 | 6070 | 6090 | SKU Description | SKU |
|------|------|------|------|------|--|--------|
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x10GbE 4-port Adapter Field Upgrade | Q8C68C |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x10GBASE-T 4-port Adapter Field Upgrade | Q8C69C |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x32Gb 2-port Fibre Channel Adapter Field Upgrade | ROP41A |
| No | No | Yes | Yes | Yes | HPE Alletra Storage 6000 1.5TB Storage Class Memory Adapter Field Upgrade | ROP48B |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x10/25GbE 2-port Adapter Field Upgrade | ROR13A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x32Gb 4-port Fibre Channel Adapter Field Upgrade | ROR15A |
| Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 2x100GbE 2-port Adapter Field Upgrade | ROR19A |

Configuration Information

Notes:

- Max One (1) Storage Class Memory kit (R0P46B or R0P48B) per 6050/6070/6090 array
- Max Two (2) 100GbE kits or 32Gb FC 4-port kits (R0R18A/R0R19A or R0R14A/R0R15A) per 6030/6050/6070/6090 array
- Max One (1) 100GbE kits or 32Gb FC 4-port kits (R0R18A/R0R19A or R0R14A/R0R15A) per 6010 array
- All 10GbE kits (Q8C17C and Q8C20C) and 32Gb FC kits (R0P34A and R0R14A) include transceivers
- The 10/25GbE Adapter Kit (R0R12A) and the 100GbE Adapter kit (R0R18A) do not include transceivers. If transceivers are required, they will need to be ordered separately.
- Each Head networking upgrade option includes two (2x) cards which are evenly populated in the two controllers.

| Transceivers (FIO) | SKU Description | SKU |
|---------------------------------------|---|--------|
| Supported with 2x10/25GbE 2-port kits | HPE Alletra Storage 6000 2x10Gb SFP+ SR FIO Transceiver | R7D05A |
| Supported with 2x10/25GbE 2-port kits | HPE Alletra Storage 6000 2x25Gb SFP28 SR 100m FIO Transceiver | R7D07A |
| Supported with 2x100GbE 2-port kits | HPE Alletra Storage 6000 2x100Gb QSFP28 MPO SR4 100m FIO Transceiver | R7D08A |
| Transceivers (BTO) | SKU Description | SKU |
| Supported with 2x10/25GbE 2-port kits | HPE Alletra Storage 6000 2x10Gb SFP+ SR Transceiver | R7D09A |
| Supported with 2x10/25GbE 2-port kits | HPE Alletra Storage 6000 2x25Gb SFP28 SR 100m Transceiver | R7D11A |
| Supported with 2x100GbE 2-port kits | HPE Alletra Storage 6000 2x100Gb QSFP28 MPO SR4 100m Transceiver | R7D12A |
| DAC Cables (BTO) | SKU Description | SKU |
| Supported with 2x10/25GbE 2-port kits | HPE Alletra Storage 6000 2x10Gb SFP+ to SFP+ 3m Direct Attach Copper Cable | R7D16A |
| Supported with 2x10/25GbE 2-port kits | HPE Alletra Storage 6000 2x25Gb SFP28 to SFP28 3m Direct Attach Copper Cable | R7D17A |
| Supported with 2x100GbE 2-port kits | HPE Alletra Storage 6000 2x100Gb QSFP28 to QSFP28 3m Direct Attach Copper Cable | R7D18A |

| 6010 | 6030 | 6050 | 6070 | 6090 | 2140 | SKU Description | SKU |
|------|------|------|------|------|------|--|--------|
| Yes | Yes | Yes | Yes | Yes | Yes | HPE Alletra Storage 6000 4x 1600W DC Power Supply Kit | R7G14A |
| No | Yes | Yes | Yes | Yes | No | HPE Alletra Storage 6000 4x 1600W AC Power Supply Kit | R8U90A |
| Yes | No | No | No | No | Yes | HPE Alletra Storage 6000 800W Titanium Spare Power Supply | S0R24A |
| No | Yes | Yes | Yes | Yes | No | HPE Alletra Storage 6000 2200W Titanium Spare Power Supply | S0R25A |
| Yes | Yes | Yes | Yes | Yes | N/A | HPE Alletra Storage 6000 2x100GbE 2-port OCP Mezzanine Adapter Field Upgrade | R6J22A |

Notes:

- The AC and DC power supply kits listed are available as standalone only (BTO) and are not available for factory integration
- The DC Power Supply Kit (R7G14A) includes four (4) DC power supplies; one (1) DC Power Supply Kit per array or shelf should be ordered for systems to be installed in environments utilizing DC power infrastructure
- The 1600W AC power supplies (R8U90A) are 80 PLUS Platinum certified
- the S0R24A and the S0R25A AC power supplies are 80 PLUS Titanium certified



Technical Specifications

| Physical Dimensions | | | | | | |
|---|--|-------------------------|----------------|--------------|--|------|
| | Width in/mm | Depth in/mm | Height in/mm/U | Weight lb/kg | | |
| HPE Alletra Storage 6000 | 17.3/439 | 31.5/800 | 6.9/175.8/4 | 120/54.5 | | |
| Power Requirements | | | | | | |
| | 6010 | 6030 | 6050 | 6070 | 6090 | 2140 |
| Input Voltage, frequency (R7G12A - 800W AC PSU w/C14 connector) | 100-120V, 50-60Hz, 9.4A 200-240V, 50-60Hz, 4.5A | | | N/A | 100-120V, 50-60Hz, 9.4A 200-240V, 50-60Hz, 4.5A | |
| Input Voltage, frequency (SOR22A - 800W AC PSU w/C14 connector) | 200-240V, 50-60Hz, 4.35A | N/A | | | 200-240V, 50-60Hz, 4.35A | |
| Input Voltage, frequency (R7G13A - 1600W AC PSU w/C14 connector) | N/A | 200-240V, 50-60Hz, 8.7A | | | | N/A |
| Input Voltage, frequency (SOR23A - 2200W AC PSU w/C14 connector) | N/A | 200-240V, 50-60Hz, 10 A | | | | N/A |
| Input Voltage, frequency (1600W DC PSU) | -48 to -72 VDC, 45A | | | | | |
| Max power requirements (VA) | 1272 | 1697 | 1998 | 2443 | 2692 | 500 |
| Thermal (BTU/hour) | 3815 | 5043 | 6033 | 7022 | 7841 | 1711 |
| Refrigeration (tons) | 0.32 | 0.42 | 0.50 | 0.59 | 0.65 | 0.14 |

Notes:

- 6070 & 6090 require 1600W/2200W PSUs and 200-240V power or DC PSU
- For the highest redundancy, use 1600W/2200W PSUs with 6030 and 6050. The R7G12A power supplies support both low-line and high-line
- The R7G13A, SOR22A, SOR23A power supplies support high-line; no low-line support
- The R7G13A power supplies are recommended when there is a choice between R7G12A and R7G13A
- Both the R7G12A and the R7G13A AC power supplies are 80 PLUS Platinum certified
- Both the SOR22A and the SOR23A AC power supplies are 80 PLUS Titanium certified
- The Titanium certified power supply kits (SOR22A & SOR23A) are mandatory to meet EU Lot9 requirements

| Environmental Specifications ¹ | |
|---|---|
| Operating Temperature | 10 - 35° C (50 - 95° F) Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m) |
| Shipping Temperature | 0° C - 40° C (32° F - 104° F) Maximum rate of change is 20°C/hr (36°F/hr) |
| Operating Altitude (ft/m) max. | 10,000 ft / 3,048 m |
| Shipping Altitude (ft/m) max. | 40,000ft/ 12,192 m |
| Humidity | 8 - 90%, non-condensing |
| Shipping Humidity | 5 - 95%, non-condensing |
| Operating Vibration | 0.25 G, Sine 5 - 200 Hz (approx. 15 min/axis); 0.4 GRMS, Random 5 - 200 Hz (approx. 60 min/axis) |
| Non-operating Vibration | 0.5 G, Sine 5 - 200 Hz (approx. 15 min/axis); 0.98 GRMS, Random 5 - 500Hz (approximate 30 min/axis) |
| Operating Shock | 20 G, 2.5ms, half-sine, one shock on each side |
| Non-operating Shock | 20 G, 10ms, square wave, one shock on each side |

Notes: ¹ Specifications are subject to change without notice.

Technical Specifications

Electromagnetic Compatibility

- Subpart B of Part 15 of FCC Rules for Class A digital devices
- ICES-003, Issue 6, dated January 2016 (Class A)
- VCCI V-3: April 2014 (Class A)
- EN 55022:2010
- CISPR 22:2008
- AS/NZS CISPR 22:2009 +A1:2010
- EN55032:2012
- CISPR 32:2012
- EN 55024:2010
- CISPR 24:2010 +A1:2015
- TCVN 7189:2009
- NBTC TS 3001-2555
- TP TC 020/2011

Safety

- EN60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
- IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
- EN60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013
- UL/IEC 60960-1 2nd Ed. Am1 + Am2
- CNS14336-1 ('99)
- CNS13438 ('95)
- NOM-019-SCFI-1998
- NBTC TS 4001-2550
- TP TC 004/2011
- IS 13252 (PART 1):2010 +A1:2013 + A2:2-15
- SANS IEC 60950-1

Certifications / Markings

- UL
- cUL
- CE
- FCC Class A
- IC Class A
- VCCI Class A
- RCM
- BSMI Class A
- KC
- CCC Exemption
- NOM
- MoEc
- NBTC SDoC
- CITC/CoC*
- EAC
- BIS
- LOA (S. Africa)
- RoHS 2011/65/EU, EN50581:2012
- WEEE



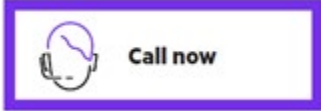
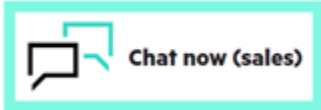
Summary of Changes

| Date | Version History | Action | Description of Change |
|-------------|-----------------|---------|---|
| 01-Jul-2024 | Version 17 | Changed | Configuration Information section was updated |
| 05-Feb-2024 | Version 16 | Changed | HPE Services Rebranding |
| 18-Sep-2023 | Version 15 | Changed | Configuration Information section was updated |
| 21-Aug-2023 | Version 14 | Changed | Service and Support and Configuration Information sections were updated |
| 07-Aug-2023 | Version 13 | Changed | Overview, Configuration Information and Technical Specifications sections were updated |
| 15-May-2023 | Version 12 | Changed | Configuration Information section was updated |
| 06-Mar-2023 | Version 11 | Changed | Service and Support and Configuration Information sections were updated |
| 06-Feb-2023 | Version 10 | Changed | Overview and Configuration Information sections were updated |
| 10-Jan-2023 | Version 9 | Changed | Configuration Information section was updated |
| 06-Jun-2022 | Version 8 | Changed | Standard Features, Service and Support and Configuration Information sections were updated. |
| 07-Feb-2022 | Version 7 | Changed | Configuration Information section was updated. |
| 06-Dec-2021 | Version 6 | Changed | Service and Support and Configuration Information sections were updated. |
| 01-Nov-2021 | Version 5 | Changed | Configuration Information section was updated. |
| 15-Sep-2021 | Version 4 | Changed | Standard Feature, Service and Support and Configuration Information sections were updated. |
| 06-Jul-2021 | Version 3 | Changed | Overview, Service and Support and Configuration Information sections were updated. |
| 17-May-2021 | Version 2 | Changed | Overview, Standard Features, Service and Support and Configuration Information sections were updated. |
| 04-May-2021 | Version 1 | New | New QuickSpecs. |



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